ACE2305B

P-Channel Enhancement Mode Field Effect Transistor

Description

The ACE2305B uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications. It is ESD protected.

Features

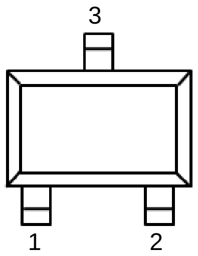
- V_{DS}=-20V, I_D=-4.3A
- $R_{DS(ON)}$<55mΩ @ V_{GS}=-4.5V
- $R_{DS(ON)}$<63mΩ @ V_{GS}=-2.5V
- $R_{DS(ON)}$<73mΩ @ V_{GS}=-1.8V
- ESD Protected: 3000V HBM

Absolute Maximum Ratings

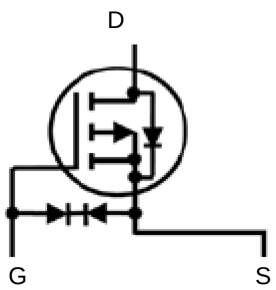
Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±8	V
Drain Current (Continuous)	T_A=25°C	I_D	-4.3	A
	T_A=70°C		-3.4	
Drain Current (Pulse)		I_{DM}	-32	A
Power Dissipation	T_A=25°C	P_D	1	W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Packaging Type

SOT-23-3



SOT-23-3	Description
1	Gate
2	Source
3	Drain



Ordering information

ACE2305B XX + H

- H: Halogen - free
- +: Pb - free
- XX: BM : SOT-23-3

Electrical Characteristics

T_A=25 °C unless otherwise noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=-250uA	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-16V, V_{GS}=0V			-1	uA
Gate Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-4A		42	55	mΩ
		V_{GS}=-2.5V, I_D=-4A		48	63	
		V_{GS}=-1.8V, I_D=-2A		56	73	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250uA	-0.3	-0.65	-1	V
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-4A	8	16		S
Maximum Body-Diode Continuous Current	I_S				-2.2	A
Drain Forward Voltage	V_{SD}	I_S=-1A,V_{GS}=0V		-0.81	-1	V
Switching characteristics(3)						
Total Gate Charge	Q_g	V_{DS}=-10V, I_D=-4A V_{GS}=-4.5V		4.59	5.97	nC
Gate-Source Charge	Q_{gs}			2.14	2.78	
Gate-Drain Charge	Q_{gd}			2.51	3.26	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=-10V,R_L=2.5Ω I_D=-4A, V_{GEN}=-4.5V R_G=3Ω		965.2	1930.4	ns
Turn-On Rise Time	t_r			1604	3208	
Turn-Off Delay Time	$t_{d(off)}$			7716	15432	
Turn-Off Fall Time	t_f			3452	6904	
Dynamic characteristics(3)						
Input Capacitance	C_{iss}	V_{DS}=-10V, V_{GS}=0V f=1.0MHz		36.45		pF
Output Capacitance	C_{oss}			128.57		
Reverse Transfer Capacitance	C_{rss}			15.17		

Note: 1. Pulse width limited by maximum junction temperature

2. Pulse test: PW≦300us, duty cycle≦2%

3. For design AID only, not subject to production testing.

4. Switching time is essentially independent of operating temperature.

Typical Performance Characteristics

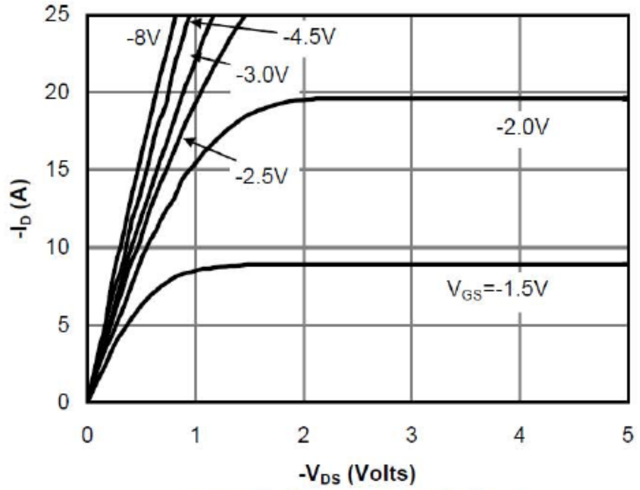


Fig 1: On-Region Characteristics

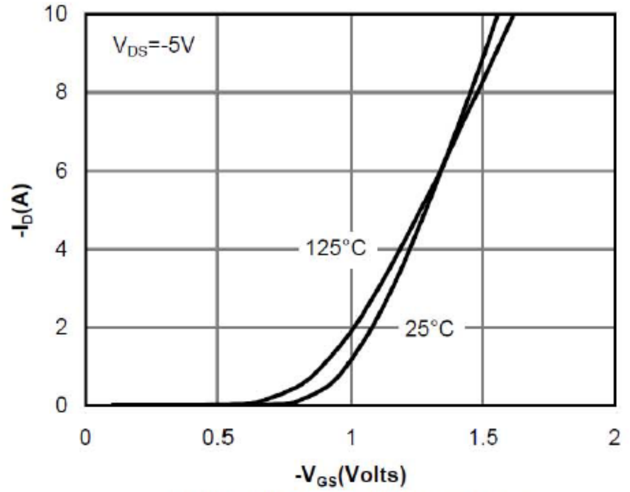


Figure 2: Transfer Characteristics

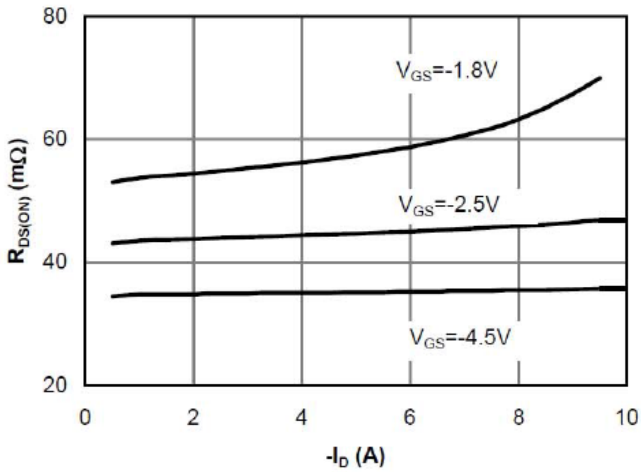


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

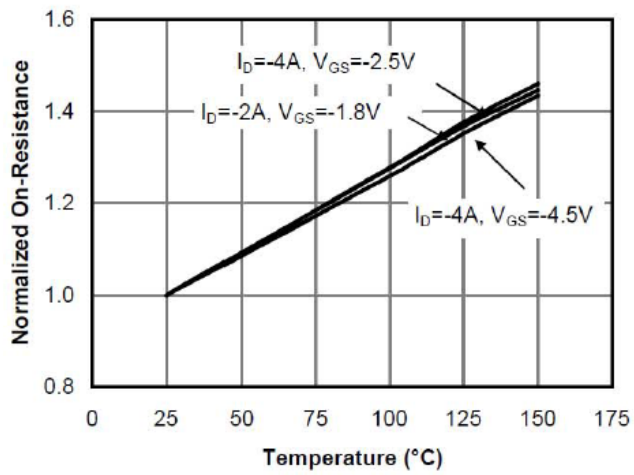


Figure 4: On-Resistance vs. Junction Temperature

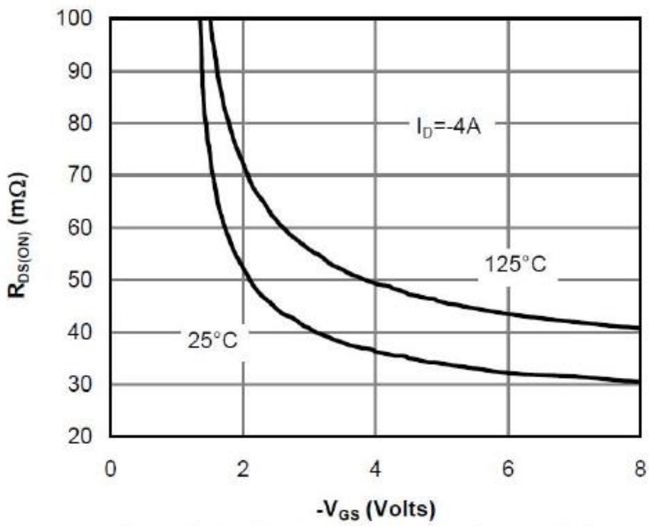


Figure 5: On-Resistance vs. Gate-Source Voltage

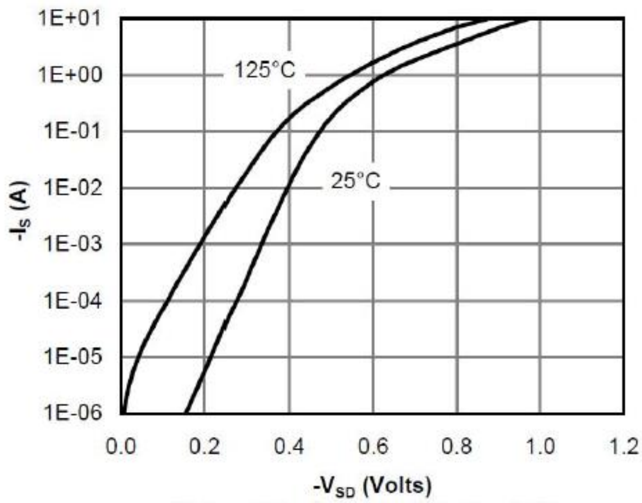


Figure 6: Body-Diode Characteristics

Typical Performance Characteristics

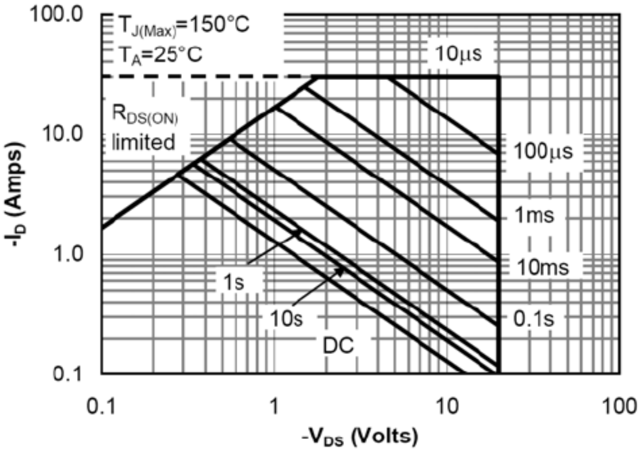


Figure 7: Maximum Forward Biased Safe Operating Area

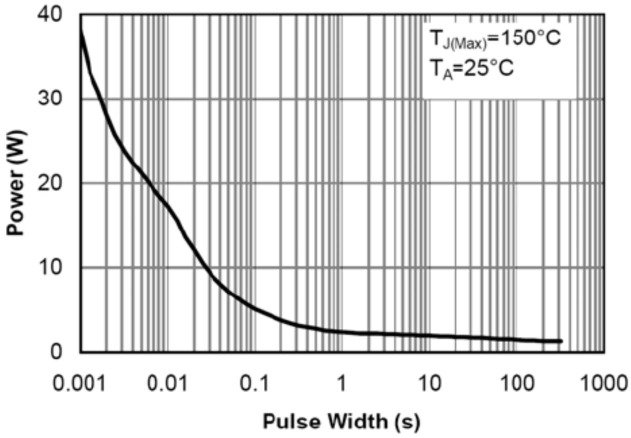


Figure 8: Single Pulse Power Rating Junction-to-Ambient

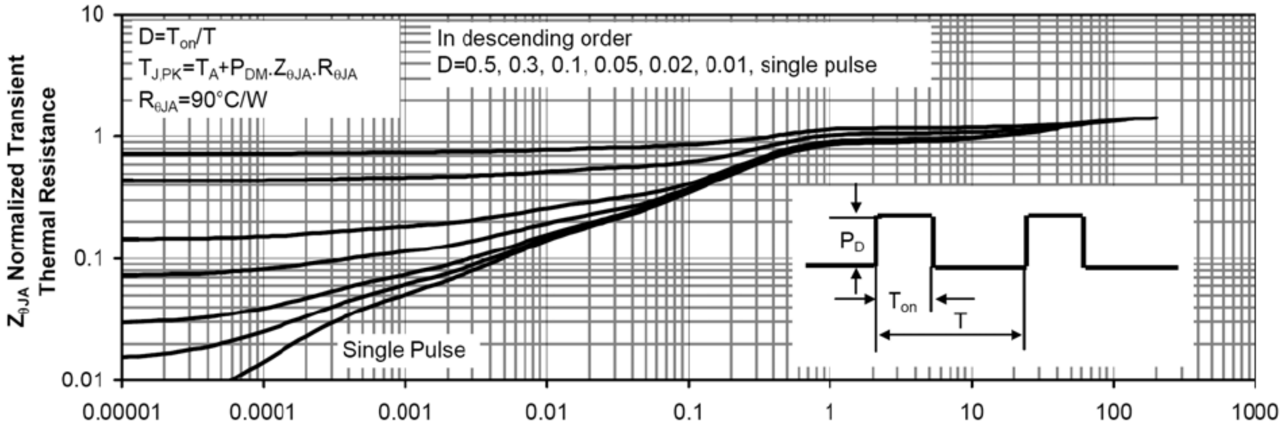
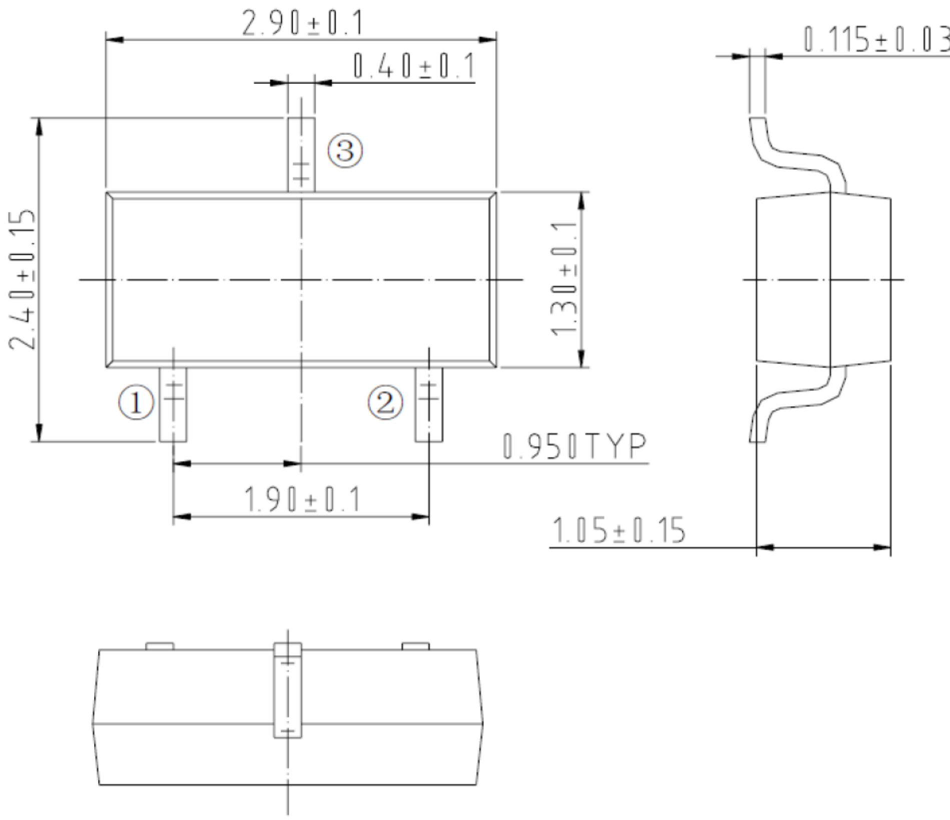


Figure 9: Normalized Maximum Transient Thermal Impedance

Packing Information

SOT-23-3



Unit: mm

Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Electronics Co., LTD. As sued herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and shoes failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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